[0037] FIG. **1** shows an electronic reader device incorporating two or more displays that are integrated together in the form of electronic pages that can be turned around a central spinal column bind;

[0038] FIG. **2** shows an electronic reader device incorporating two or more displays that are integrated together in the form of electronic pages about a central rectangular block bind;

[0039] FIG. **3** illustrates the action of turning the electronic pages about the central spinal bind;

[0040] FIG. **4** shows an e-reader device after the upper page has been turned to the back, resulting in the underlying electronic page surface coming to the top of the pages;

[0041] FIG. **5** illustrates a scroll wheel incorporated into the central spinal column of the device;

[0042] FIG. **6** shows an enlarged illustration of the scroll wheel of FIG. **5**;

[0043] FIG. **7** illustrates an e-reader with a simulated action of folding over the corner of a page;

[0044] FIG. **8** shows a section of the central spine of an embodiment of the e-reader containing technology elements that are common to the electronic pages of the device;

[0045] FIG. **9** shows an e-reader device wherein each page of the device comprises double-sided pages integrated together about a central spinal column bind;

[0046] FIG. **10** illustrates an electronic reader that incorporates two or more electronic pages that are able to be detached from the main e-reader unit;

[0047] FIG. **11** shows two electronic readers that can be joined together to form a single e-reader unit;

[0048] FIG. **12** shows a docking station which allows new reading material to be uploaded and the battery of the device to be recharged by the use of a USB or other interface port; and

[0049] FIG. **13** shows a block diagram of an embodiment of an electronic document reading device according to the invention, including a flow diagram of a document reading procedure.

[0050] We will describe a page refreshing electronic document reader (e-reader) that incorporates two or more electronic pages attached to a spinal column. The two or more displays are integrated by being bound together by the spinal column to allow a page turning motion. Each electronic page is discretely refreshed upon being turned around the central bind of the e-reader. In addition the e-reader preferably incorporates a touch screen which allows for book marking of pages by electronically marking the corner of a chosen page. Further features, such as the addition of a scroll wheel may be attached to the central spine to allow the user to quickly operate a menu system.

[0051] The skilled person will appreciate that, although preferred embodiments of our e-reader have two pages, devices with only a single page are also useful, and embodiments of the invention are note limited to having two turnable pages.

[0052] Embodiments provide a variety of user friendly, hand-held, electronic reading devices that incorporate a number of operable functions. An electronic reader is generally a handheld electronic device which may be used for example for reading electronic documents, such as newspapers, pdf documents, books, electronic mails and attachments. Embodiments generally comprise a display through which the user accesses the document, a host module which runs document reading software, and loads the correct data into the display, and an interface through which documents can be loaded onto the electronic reader. The electronic reader may comprise other functionalities, such as (but not limited to) touch panel, or other user input functions, personal digital assistant (PDA), digital music player or mobile phone functions.

[0053] The display may be a liquid crystal display device or an emissive display, but preferably the display is a reflective display which is easily readable in bright daylight, such as a bistable, electrophoretic display. The display may be a rigid display incorporating a glass substrate, but preferably the display is a flexible display fabricated on a flexible substrate, such as a plastic, thin metal or glass substrate. The display may be a directly driven or passive matrix display, but preferably the display is an active matrix display comprising an active matrix of thin film transistors (TFTs), such as amorphous silicon, polycrystalline silicon or organic TFTs.

[0054] We will describe an electronic reader device that incorporates two or more refreshable electronic pages displayed on more than one display. In this specification we generally use the term "refresh" to refer to updating a page display to include this information. We address technological limitations that exist for some display technologies which are of interest for electronic readers, such as electrophoretic displays. Electrophoretic displays do not provide fast refreshing and update capability, which means that after finishing a page there is a problem displaying the next page seamlessly. We will describe a system in which the next page is displayed on a second display in such a way that the second display can be updated whilst partially or substantially hidden while the previous page is being read.

[0055] One version of the electronic reader device provides a single unit which integrates two or more displays together in the form of electronic pages, in which a user is able to physically turn the pages of the e-reader. The motion of turning the pages of the e-reader enables each page to refresh as or soon after it is turned. We enable this refreshing process to occur out of sight from the user. The page that is being refreshed is hidden behind the subsequent upper electronic page and so the user is not privy to the refreshing process enabling a smooth page-turning process. The user is able to read text that is stored electronically using this page turning feature which maintains a sequential page reading experience.

[0056] To further aid the experience the e-reader preferably incorporates a touch screen display. Such a display provides the user with the ability to book mark pages by simulating the action of folding over the corner of a page. The addition of touch screen capability within the e-reader device enables the user to electronically fold over the corner of an electronic page in order to book mark a chosen page with a book mark symbol therefore allowing for easy reference when scrolling through the pages of the e-reader device. Once it is no longer necessary for the user to maintain the book marked page, the book mark symbol may be turned off.

[0057] In a preferred device the electronic reader incorporates two or more electronic pages or display devices bound to a spinal column. In this and the other described embodiments of this and other aspects of the invention the spinal column may be substituted by an alternative page binding. Upon turning over an upper page of the e-reader, said upper page is electronically refreshed, while an underlying page is brought to the surface of the e-reader and is able to be viewed by the user.